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Four New Species of the Genus *Neseuthia* SCOTT, 1922 (Coleoptera, Scydmaenidae) from Japan

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Abstract The genus *Neseuthia* SCOTT (Coleoptera, Scydmaenidae) is reported for the first time to occur in Japan. Four new species are described: *N. nomurai* sp. nov., *N. hobbiti* sp. nov., *N. japonigena* sp. nov., and *N. cactiformis* sp. nov. Male copulatory organs of the new species are illustrated and an identification key is provided. Additionally, a key for Japanese genera of the tribe Cepheniini has been included.

Introduction

The genus *Neseuthia* SCOTT is composed of twenty two species distributed in SW Pacific, Australia, Seychelles, Mascarene Is., Sri Lanka and Sumatra (NEWTON and FRANZ, 1995). Only three species have been described from the Oriental region, namely *N. anderssoni* FRANZ, 1982 and *N. minima* FRANZ, 1983 from Sri Lanka, and *N. sumatrana* FRANZ, 1984 from Sumatra (FRANZ 1982; 1984; 1985). In the present paper four new species are described from Okinawa, Kagoshima and Nagasaki prefectures, Japan. The depository of the type material is the National Science Museum, Tokyo (NSMT) and Fukui University, Fukui (FU).

Taxonomy

Genus *Neseuthia* SCOTT

Neseuthia SCOTT, 1922, p. 201. Type species: *Neseuthia typica* SCOTT, 1922, by original designation.

The genus *Neseuthia* SCOTT belongs to the tribe Cephenniini within the subfamily Scydmaeninae. Members of *Neseuthia* can be identified by the following set of characters: body relatively small, ovoid, very convex; head up to hind margins of convex eyes retracted into pronotum, widest at eyes, not narrowed posteriorly behind eyes, frons or vertex in males of some species has various modifications (tubercles, pits, impressions, grooves); mandible sickle-shaped, broad in basal third then rapidly tapered toward pointed apex, without subapical teeth; maxillary palpomere III ovoid, broad; palpomere IV very small, short and broad, hardly visible. Antenna with club composed usually of three antennomeres, sometimes club indistinctly demarcated or antennomere IX only slightly larger than preceding ones, so that the club appears to be composed of two segments. Pronotum subquadrate or slightly longer than wide, widest in anterior half, with anterior margin broadly emarginate and sides narrowing toward base, lateral edges entire, sharp, hind angles distinct, sometimes sharp; base of pronotum with various number of foveae (usually four; a pair near each hind angle), in some cases all pits or only internal foveae connected by a transversal groove, pronotum sometimes with a longitudinal median groove. Elytra oval, relatively short, widest in anterior half or near middle, apex broadly rounded or each elytron rounded separately; apex of pygidium sometimes exposed; base of elytra with a single pit and variably developed humerus, internal humeral groove may or may not be present, elytral punctation scarce and

composed of shallow, small punctures; elytral setation relatively short, recumbent to suberect, sometimes with additional sparse, long and erect setae. Legs short, slender, procoxae separated by a narrow prosternal process, meso- and metacoxae equidistantly wide separated, femora slightly clavate, tibia slender.

Remarks. The genus name *Neseuthia* was derived by SCOTT from *Eutheia* STEPHENS, which is currently classified within the tribe Eutheiini. Members of Eutheiini can be distinguished from Cephenniini by having a slender, usually flat body, the entirely exposed subhorizontal pygidium, and the head narrowing posteriorly behind eyes, not retracted into the pronotum. Species of the genus *Neseuthia* possess a convex, ovoid body. Also, the head is not narrowed behind eyes and retracted into pronotum up to the hind margin of eyes. However, the body form may be regarded as slender when compared to other genera of Cephenniini, and in some species the apex of pygidium remains exposed.

Within the tribe Cephenniini members of *Neseuthia* are most similar to the genus *Paraneseuthia* FRANZ, from Fiji Is. (FRANZ, 1986) and Russian Far East (KURBATOV, 1999, 1991). Both genera share similar body shape, relatively slender as compared to other Cephenniini. The only four known members of *Paraneseuthia* differ from all species of *Neseuthia* by having very short prosternal process, not separating procoxae, less convex body, dense and strong elytral punctation, long and erect elytral setation and lack of the male secondary sexual characters. *Paraneseuthia trepida* KURBATOV is unique among Cephenniini in having maxillary palpi composed of only three segments; according to KURBATOV (1990), palpomere IV is completely fused with III so that the suture between them is not visible. Maxillary palpi of the remaining species of the genus *Paraneseuthia* have not been described.

The very small body size, the pronotum with two pairs of basal pits (internal pits connected by a transversal groove in some species), presence of the prosternal process and male secondary sexual characters located on the head represent similarities between *Neseuthia* and *Cephennomicrus* REITTER. The latter genus has been established for a single species from Usambara Mts., Tanzania (REITTER, 1907), remaining twelve out of thirteen known species have been described from Madagascar and Grand Comore Is. by BESUCHET (1961). *Cephennomicrus* differs from *Neseuthia* by having a very stout body form; the elytra are only slightly longer than the pronotum. However, the actual relationships between the genera within Cephenniini remain unclear, and a comprehensive revision of the group is required.

The Japanese genera of Cephenniini can be distinguished by means of the following key.

Key to the Genera of Cephenniini of Japan

1. Body rather slender; pronotum usually with two pairs of basal foveae, sometimes basi-lateral foveae connected by a transversal groove, in many cases head in males with sexual characters. ..... *Neseuthia* SCOTT
–. Body stout; pronotum always with a single pair of basi-lateral foveae, head in males without sexual characters. 2
2. Aedeagus with drop-like median lobe, narrowing toward pointed apex, parameres always asymmetrical, surrounding median lobe, their apical parts approximate. .... *Cephennodes* REITTER
–. Aedeagus with voluminous, bulbous basal part, without separate drop-like median lobe, parameres symmetrical or asymmetrical, their apical parts usually not approximate. ..... *Chelonoidum* STRAND

The generic characters for *Cephennodes* and *Chelonoidum* given above differ from the key features being used in the existing literature. The genus *Cephennodes* is often defined as having lateral carinae on the pronotum and asymmetrical parameres, whereas *Chelonoidum* is usually characterized by lacking pronotal carinae and having symmetrical parameres (e.g. in KURBATOV, 1995, and the key in JAŁOSZYŃSKI, (2002). However, the lateral carina on the pronotum may be indistinct in some species of *Cephennodes* (e.g. *C. vafer* KURBATOV, 1995) which makes the generic level identification on the basis of external features impossible. Moreover, the parameres in *Chelonoidum* are not always clearly symmetrical (e.g. *Ch. torosum* KURBATOV, 1995) and in some Asiatic species the parameres are distinctively asymmetrical (JAŁOSZYŃSKI, unpublished observations). Therefore, the general design of the aedeagus, and especially the presence of a characteristic drop-like median lobe in *Cephennodes* remain the only available generic differences between the two genera, as presented in the above key.

The Japanese species of *Neseuthia* can be identified by the following key:

Key to the Males of *Neseuthia* of Japan

1. Pronotum with median longitudinal groove. 2
–. Pronotum without median longitudinal groove. 3
2. Vertex with relatively flat central expansion, divided into posterior and anterior part by a pair of transversal tubercles. ..... *N. nomurai* sp. nov.
–. Vertex with very convex central expansion, without transversal division. ..... *N. hobbiti* sp. nov.
3. Pronotum punctate; lateral tubercles on vertex clearly visible, large; each elytron with two long erect lateral setae. ..... *N. japonigena* sp. nov.
4. Pronotum impunctate; lateral tubercles on vertex very small, hardly noticeable; each elytron with three long, erect lateral setae. ..... *N. cactiformis* sp. nov.

Neseuthia nomurai sp. nov.

[Japanese name: Yaeyama-harabiro-kokemushi]
(Figs. 1; 2A; 3A; 4C; 5A–C)

Diagnosis. Neseuthia nomurai can be distinguished from all other Japanese species by having a longitudinal groove on pronotum, lacking long lateral setae on pronotum and elytra and by the presence of median longitudinal tubercle or expansion on head of males. The expansion is divided into a subrectangular anterior and subtriangular posterior part by a pair of small, transversal, elongate subtriangular tubercles.

Description. Body relatively slender, with a distinct division between pronotum and elytra, reddish-brown, with moderately dense, suberect golden setation.

Male (Fig. 1; 2A). Body length: 1.09–1.13 mm. Head (Fig. 3A) widest at eyes, in natural position retracted into pronotum up to hind edge of eyes, length: 0.14–0.16 mm, width: 0.27 mm. Vertex and frons with central longitudinal expansion as wide as one-third of vertex, divided into anterior and posterior part by a pair of small, transversal, subtriangular tubercles. Posterior part widest and highest near transversal tubercles, narrowing and lowering posteriorly, on each side connected with hind margin of eyes by shallow, slanting transversal groove. Anterior part of median expansion subrectangular, shorter than wide, located in a shallow depression of frontoclypeal area. Supraantennal tubercles convex, elongate, running toward transversal tubercles of median expansion. Frontoclypeal area subtriangular, slightly depressed, with a pair of shallow but distinct

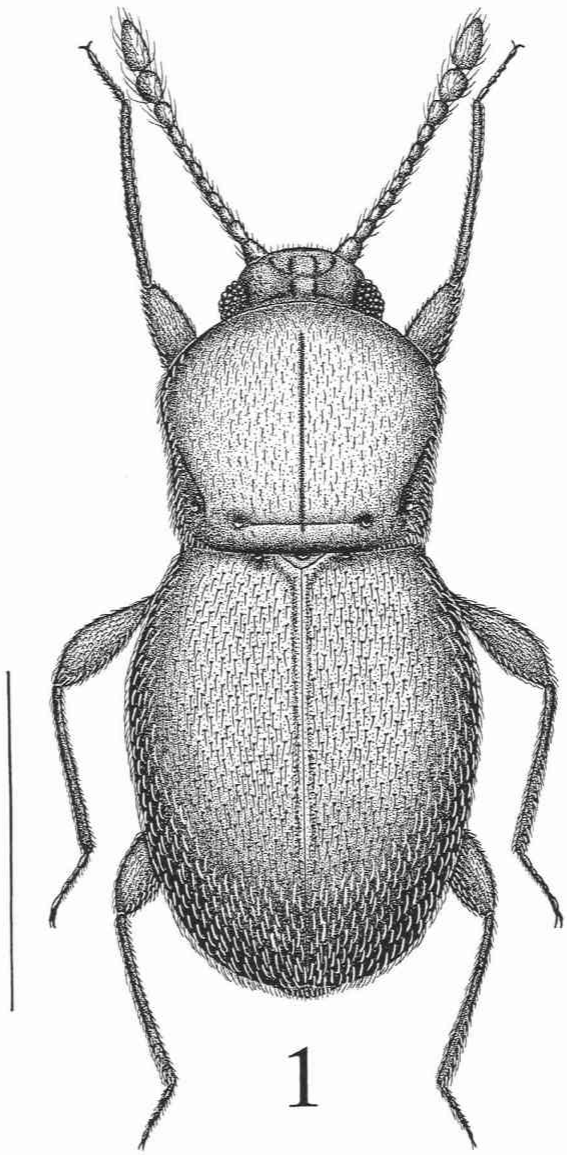

Fig. 1. *Neseuthia nomurai* sp. nov., habitus of the male. Scale: 0.5 mm.

lateral pits. Clypeus subrectangular, transversal, mouthparts hardly visible in dorsal view. Eyes very convex, large, nearly hemispherical, coarsely faceted, with sparse and short erect setae. Dorsum glossy and impunctate, except for sparse but slightly coarse punctation on area delimited by anterior edge of median expansion, fronto-lateral pits and clypeus; setation composed of short and sparse recumbent to suberect setae. Antenna (Fig. 4C) slightly longer than combined length of head and pronotum, with long, suberect setation, and with indistinctly delimited, elongate club composed of last three antennomeres. Antennomere I subconical, 1.5 x as long as wide; II–VIII narrower than I and IX; II twice as long as wide; III–VI subquadrate; VII–VIII 1.5 x as long as wide; IX with conical basal and distal part, wider than VIII; X similar in shape to IX but slightly

larger; XI as long as two preceding antennomeres together, 2.2 x as long as wide, widest near middle, oval, elongate, apex pointed.

Pronotum very convex, wider than long, widest at anterior third, narrowing posteriorly, sides in hind third nearly parallel, length: 0.325 mm, width at base: 0.375 mm, maximal width: 0.4 mm. Anterior edge broadly emarginate, front angles well developed, projecting anteriorly (in strictly dorsal view front angles not visible). Lateral edges entire, sharp, sides not serrated, hind angles rounded. Base of pronotum nearly straight, with two pairs of small and shallow basi-lateral pits, internal pits connected with shallow, but distinct transversal groove, external pits located near hind angles of pronotum. Area between external pit and lateral margin of pronotum impressed, distinctly delimited from convex median part of pronotum. Disc with narrow and relatively deep median

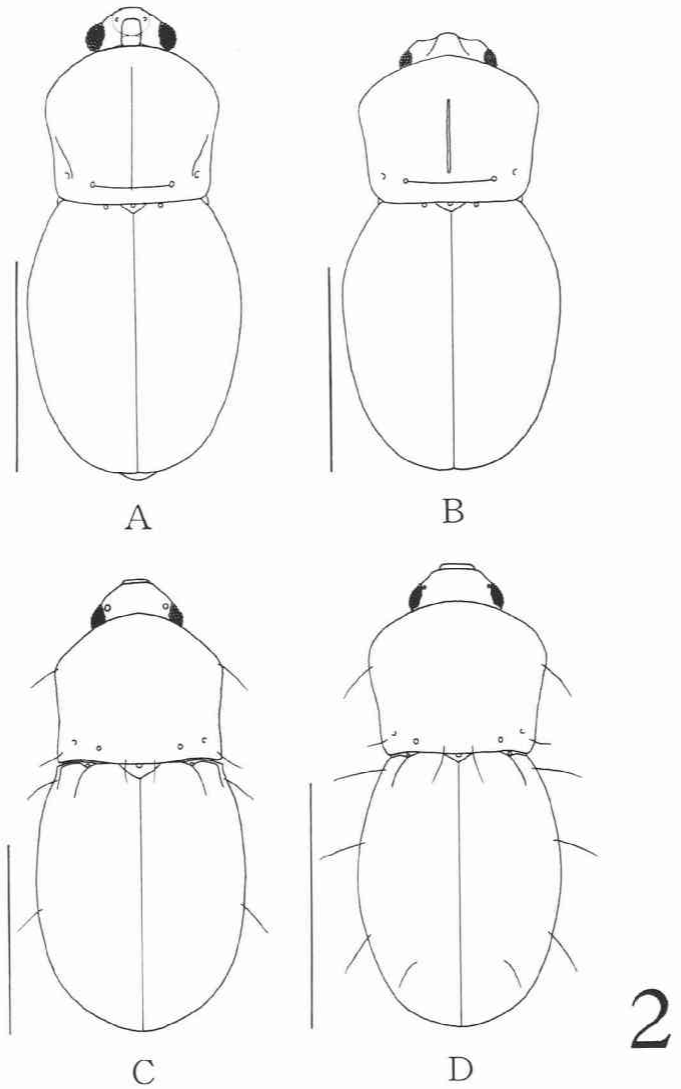

Fig. 2. Schematic body outline. —A, *N. nomurai* sp. nov.; B, *N. hobbiti* sp. nov.; C, *N. japonigena* sp. nov.; D, *N. cactiformis* sp. nov. Scale: 0.5 mm.

longitudinal groove, not reaching anterior edge of pronotum, posteriorly slightly trespassing transversal basal groove. Disc glossy, sculpture composed of small and very indistinctly delimited grains; setation composed of short, moderately sparse, suberect setae.

Elytra entire, separately rounded at apex, very convex, at base as wide as the base of pronotum, widest at anterior third, length: 0.625 mm, maximal combined width: 0.54 mm. Apical part of pygidium exposed. Scutellum large, triangular, with distinct median pit at base. Adsutural area of elytra slightly depressed, suture sligthly raised; humeri distinct, without internal humeral carina or groove; each elytron with small, deep basal pit located closer to scutellum than humerus. Elytra glossy, sculpture slightly more distinct than that on pronotum, composed of small setiferous granules; setation relatively sparse, composed of short, suberect setae. Hind wings well developed, nearly twice as long as elytra.

Venter: Procoxae separated by narrow prosternal process, basisternal area of prosternum with sparse punctation, individual punctures irregular in shape. Mesosternum between mesocoxae 3 x as wide as prosternal process, with very large and coarse punctures and sharp longitudinal carina. Metasternum as long as pro- and mesosternum together, very convex, glossy and impunctate, metacoxae separated slightly wider than mesocoxae. Six abdominal sternites visible, sternite I 1.5 x longer than subequal sternites II–V (measured along midline), sternite VI subtriangular, as long as sternites IV–V together, apex rounded. Sutures between sternites arcuate. Ventral side with relatively sparse, short, recumbent setation, except for abdominal sternites covered with long, suberect setae.

Legs relatively long and slender, with short, recumbent and suberect setation. All coxae elongate, transverse; mesocoxae longest, with a dense row of long setae on posterior (internal) edge. Trochanters elongate, pro- and mesotrochanters twice as long as wide, metatrochanters nearly 3 x as long as wide. Femora clavate, proximal parts narrower than trochanters, from basal fourth-third gradually expanded, widest between half and distal third, then narrowing toward apex. Tibiae slender, very slightly recurved. Tarsi slender, tarsomere I 1.5 x as long as wide, II–IV diminishing in size, V nearly as long as two preceding tarsomeres together.

Male genitalia: Aedeagus (Fig. 5A–C) in dorso-ventral view drop-shaped, symmetrical, length: 0.26 mm, with rounded base, narrowing toward truncate apex, with elongate, slender parameres not exceeding median lobe in length. Parameres curved, with broadened apex bearing one long and two short setae. Ventral opening inversely subtriangular, indistinctly delimited, located below base of parameres; dorsal opening large, located in apical half of median lobe, subtriangular. Armature of internal sac composed of well sclerotized longitudinal median projection with bifurcate apex, in side view strongly curved ventrally; and with two pairs of elongate lateral sclerites pointed at apex. Each pair of lateral sclerites possesses common base, in side view they are curved in ventral direction.

Female: Body length: 1.08 mm, maximal width of elytra: 0.57 mm. Similar to male, with exception of head sculpture. Vertex slightly convex, without median expansion, delimited at each side by shallow depression near internal margin of eye. Supraantennal area slightly raised, lateral pits on frontoclypeal area missing.

Distribution. Japan: Okinawa Pref. (Ishigaki Is. and Iriomote Is.).

Type series. Holotype:♂, Mt. Omotodake, Ishigaki Is., Sakishima Archipelago, Okinawa Pref., 22–III–1984, S. NOMURA leg. (NSMT). Paratypes: forest along Shiiminato River, Iriomote Is., Sakishima Archipelago, Okinawa Pref., 1♀, 25–VII.~3–VIII–1996, 1 ♂; 8–VIII~4–IX–1996, 1♂, 5~18–IX–1996, T. MUROI and K. EBI leg. (Malaise trap) (FU).

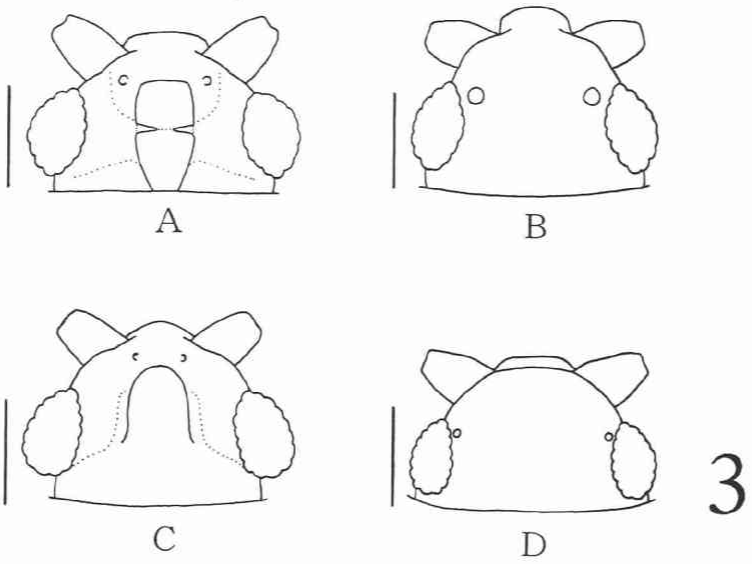

Fig. 3. Head in dorsal view. — A, *N. nomurai* sp. nov.; B, *N. japonigena* sp. nov.; C, *N. hobbiti* sp. nov.; D, *N. cactiformis* sp. nov. Scale: 0.1 mm.

Etymology. This species is dedicated to Dr. Shûhei NOMURA, who collected the type material of three out of four new species described herein.

Remarks. *Neseuthia nomurai* is similar to *N. hobbiti* sp. nov., also collected from Ishigaki Is. A unique modification of the head of the male and the shape of aedeagus provide unequivocal features to distinguish between the two species.

Neseuthia hobbiti sp. nov.

[Japanese name: Minami-harabiro-kokemushi]
(Figs. 2B; 3C; 4D; 5D–F)

Diagnosis. This species can be easily distinguished from other Japanese congeners by having longitudinal groove on pronotum, lacking long lateral setae on pronotum and elytra, and convex, longitudinal median expansion on the head. The expansion is not divided by transversal tubercles or groove.

Description. Body relatively slender, with a distinct division between pronotum and elytra, reddish-brown, with moderately dense, suberect golden setation.

Male (Fig. 2B). Body length: 1.05 mm. Head (Fig. 3C) in natural position retracted into pronotum up to hind edge of eyes, widest at eyes, length: 0.14 mm, width: 0.26 mm. Vertex and frons with very convex median longitudinal expansion with rounded sides, at each side delimited by shallow groove; supraantennal area slightly raised; frontoclypeal area subtriangular, not depressed, with a pair of small shallow pits beneath anterior edge of median expansion; clypeus subtriangular, transversal, mouthparts hardly visible in dorsal view. Antennal insertions located between eyes, beneath dorso-anterior edge of head. Eyes very convex, large, nearly hemispherical, coarsely faceted, with sparse and short erect setae. Head impunctate, glossy, with very short, thin recumbent and suberect setation. Antenna (Fig. 4D) longer than combined length of head and pronotum, with indistinctly demarcated elongate club composed of last three antennomeres, and with long, suberect setae. Antennomere I subconical, 1.5 x as long as wide; II subcylindrical,

slightly smaller than I; III–VII subequal in shape, narrower than II, slightly longer than wide; VIII slightly larger than VII; IX markedly larger than VIII, with conical basal and distal part; XI elongate, oval, widest near middle, narrowing toward pointed apex, nearly as long as two preceding segments together, twice as long as wide.

Pronotum widest at anterior third, sides narrowing toward base, in hind third nearly parallel, hind angles rounded, length: 0.32 mm, width at base: 0.34 mm, maximal width: 0.39 mm. Anterior edge broadly emarginate, front angles well developed, projecting anteriorly (in strictly dorsal view front angles not visible); base with two pairs of small and shallow lateral pits, internal pits connected with shallow but distinct transversal groove, external pits located near hind angles; median longitudinal groove relatively deep, reaching anterior fourth of pronotum, posteriorly not reaching transversal groove. Disc glossy, with very small, slightly coarse and relatively dense punctures; setation dense, composed of thin, short suberect setae.

Elytra entire, ovoid, elongate, very convex, at base as wide as base of pronotum, widest at anterior third, separately rounded at apex, length: 0.59 mm, combined width: 0.49 mm. Apex of pygidium exposed. Scutellum large, triangular, with distinct median pit at base. Adsutural area slightly depressed, suture slightly raised; humeral calli distinct; internal humeral groove absent; basal foveae distinct, located closer to scutellum than humeri. Elytra glossy, sculpture composed of small, slightly coarse grains, sparser than on pronotum; setation relatively long, composed of thin, curved, suberect setae. Hind wings well developed, twice as long as elytra.

Venter: Procoxae separated by narrow prosternal process, basisternal area of prosternum with sparse punctation, individual punctures irregular in shape. Mesosternum between mesocoxae twice as wide as prosternal process, with similar irregular punctation as that on basisternum. Metasternum as long as pro- and mesosternum together, very convex, glossy and impunctate, metacoxae separated slightly wider than mesocoxae. Six abdominal sternites visible, sternite I 1.5 x longer than subequal sternites II–V (measured along midline), sternite VI subtriangular with rounded apex, as long as four preceding sternites. Sutures between sternites arcuate. Ventral side with relatively sparse, short, recumbent setation, except for long, suberect setae on abdominal sternites.

Legs relatively long and slender, with short, recumbent and suberect setation. All coxae elongate, transverse; mesocoxae longest, with a dense row of long setae on posterior (internal) edge. Trochanters elongate, pro- and mesotrochanters twice x as long as wide, metatrochanters nearly 3 x as long as wide. Femora clavate, proximal parts narrower than trochanters, from basal fourth-third gradually expanded, widest between distal half and third, and then narrowing toward apex. Tibiae slender, pro- and mesotibiae almost straight, metatibiae slightly recurved. Tarsi slender, tarsomere I 1.5 x as long as wide, II–IV reducing in size, V nearly as long as two preceding tarsomeres together.

Male genitalia: Aedeagus (Fig. 5D–F) in dorso-ventral view with rounded basal part and well demarcated apical part, length: 0.2 mm. Parameres elongate, slender, symmetrical, not broadened near apex, shorter than ventral wall of aedeagus, with long apical seta, short subapical seta near apex, and long subapical seta distant from apex. Ventral opening small, indistinctly delimited, located below base of parameres; dorsal opening large, ovoid. Apical lobe subtriangular, with rounded sides and pointed apex. Armature of internal sac complicated, asymmetrical, with a pair of long, recurved sclerites, in dorsal view right sclerite longer, elongate S-shaped, with pointed apex exceeding apex of aedeagus. Left sclerite shorter and more slender. Additional pair of small, symmetrical, elongate, pointed sclerites visible in central part of dorsal opening.

Female: Unknown.

Distribution. Japan: Okinawa Pref. (Ishigaki Is.).

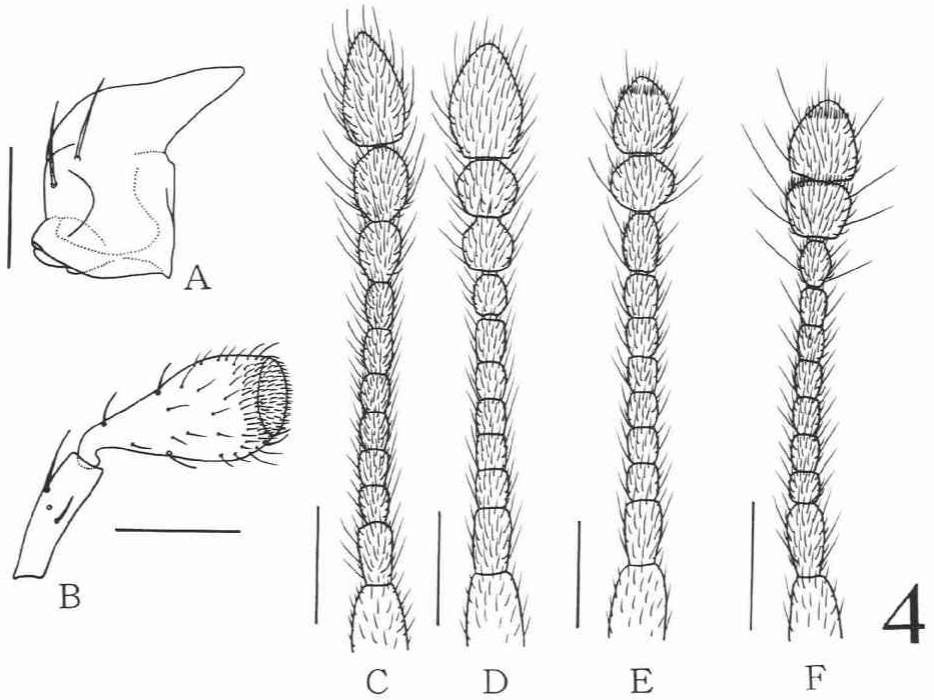

Fig. 4. Left mandible (A), left maxillary antennomeres II–IV (B) and left antenna (C–F) in dorsal view. — A, B, E. *N. japonigena* sp. nov.; C, *N. nomurai* sp. nov.; D, *N. hobbiti* sp. nov.; F, *N. cactiformis* sp. nov. Scale: 0.1 mm for A, B; 0.1 mm for C–F.

Holotype: ♂, Ishigaki Is., Sakishima Archipelago, Okinawa Pref., 28–X–1996, K. TAKAHASHI leg. (NSMT).

Etymology. The species name is derived from the hobbit, a J. R. R. Tolkien character.

Remarks. The holotype of this species has been collected by means of a truck trap. *Neseuthia hobbiti* is similar to *N. nomurai* but can be easily distinguished on the basis of differences in the shape of the head modification and male copulatory organ.

Neseuthia japonigena sp. nov.

[Japanese name: Tokunoshima-harabiro-kokemushi]
(Figs. 2C; 3B; 4A, B, E; 6A–C)

Diagnosis. *N. japonigena* is distinctly characterized by having pronotum without longitudinal groove, head with a pair of distinct tubercles, distinctly punctate pronotum, a pair of long, erect lateral setae on pronotum and a pair of long, lateral setae on each elytron.

Description. Body relatively slender, reddish-brown, with distinct division between pronotum and elytra, setation short, recumbent and sparse, yellowish, sides of pronotum and elytra with additional long, erect setae.

Male (Fig. 2C). Body length: 1.17 mm. Head (Fig. 3B) in natural position retracted into pronotum up to hind edge of eyes, widest at eyes, length: 0.12 mm, width: 0.26 mm. Vertex slightly convex, with a pair of small, yellowish tubercles, each tubercle located at

internal edge of eye, larger than single ommatidium; frontoclypeal area slightly depressed; supraantennal area raised; antennal insertions located between eyes, beneath dorso-anterior edge of head; clypeus subrectangualr; mouthparts hardly visible in dorsal view. Mandible (Fig. 4A) with quadrate basal part with two long setae located on dorsal surface near external edge, and narrow, triangular distal part tapering rapidly toward pointed apex; subapical teeth absent. Maxillary palpomere III (Fig. 4B) narrow and curved near base, expanded in distal part, widest near apical third, then narrowing toward truncate, slightly concave apex. Palpomere IV very short and broad, inserted in excavated apex of segment III, division between palpomeres III and IV indistinct. Eyes convex, large, nearly circular, coarsely faceted, with short and sparse setae. Head impunctate, glossy, glabrous. Antenna (Fig. 4E) longer than combined length of head and pronotum, with slightly flattened club composed of last three antennomeres, and with relatively sparse, recumbent and suberect setation, last three antennomeres additionally with sparse, long, erect setae. Antennal club appears two-segmented due to a significant difference in size between antennomere X and IX. Antennomere I subcylindrical, larger than II, 1.5 x as long as wide; II cylindrical, nearly twice as long as wide; III–VI equal in size, subquadrate; VII slightly larger than wide; VIII larger than VII; IX elongate, nearly twice as long as wide, widest near middle, narrowing toward base and apex; X wider than long, markedly larger than IX, with conical base and distal part; XI slightly narrower than X, subconical, widest near base.

Pronotum convex, widest near anterior third and at base, sides slightly narrowing posteriorly, in hind fourth slightly divergent; length: 0.35 mm, width at base: 0.41 mm, maximal width: 0.41 mm. Anterior edge broadly emarginate, front angles well developed, projecting anteriorly (in strictly dorsal view front angles not visible); lateral edges entire, sharp, finely serrated; base broadly biemarginate; hind angles sharp, slightly projected posteriorly; base with two pairs of shallow lateral foveae, without median longitudinal nor basal transversal groove. Punctures on disc very distinct, moderately large, unequally distributed, slightly larger and slightly coarse near sides, surface between punctures glossy; setation sparse, short, recumbent. Additionally, each side of pronotum with a pair of long, erect lateral setae; one at anterior third, the other one in hind angle; also base of pronotum with a pair of long posteriorly-directed setae located in the middle, at both sides of scutellum.

Elytra entire, ovoid, widest near middle, very convex, separately rounded at apex; length: 0.7 mm, combined width: 0.54 mm. Distal part of pygidium exposed. Elytral base as wide as base of pronotum, with distinct humeri delimited by shallow, but distinct internal humeral groove, and with small humeral denticle; basal foveae small, located in middle between scutellum and humeral denticle; scutellum triangular, with distinct medio-basal pit. Elytra glossy, punctures very fine and sparse, hardly noticeable; setation composed of very short, sparse recumbent setae; additionally each elytron with a pair of long, erect lateral setae. Hind wings well developed, nearly twice as long as elytra.

Venter: Procoxae separated with narrow prosternal process, basisternal area of prosternum with sparse, irregular in shape and unequally distributed punctures. Mesosternum between mesocoxae twice as wide as prosternal process, with longitudinal carina and similar irregular punctures as on basisternum. Metasternum as long as pro- and mesosternum together, with small, but distinct tubercle in hind third of midline, very convex, glossy and impunctate; metacoxae separated equally widely as mesocoxae. Six abdominal sternites visible, sternite I as long as II and III together; II–V subequal in length; VI subtriangular, nearly twice as long as two preceding sternites, apex broadly rounded. Sutures between sternites slightly arcuate. Ventral side with relatively sparse, short, recumbent setation, setae on abdominal sternites slightly longer.

Legs relatively long and slender, with relatively short, recumbent and suberect

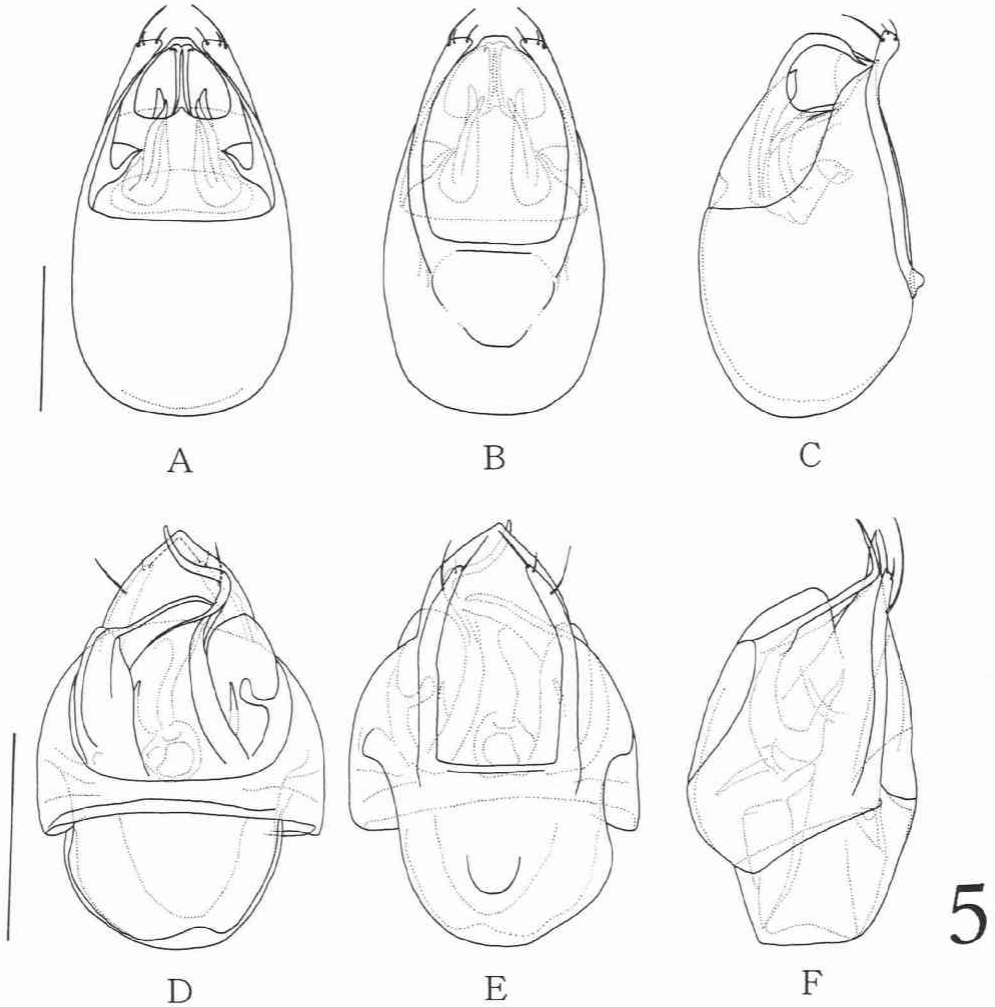

Fig. 5. Aedeagus in dorsal (A, D), ventral (B, E) and lateral view (C, F). — A, B, C, *N. nomurai* sp. nov.; D, E, F, *N. hobbiti* sp. nov. Scale: 0.1 mm.

setation. All coxae elongate, transverse, mesocoxae longest, pro- and mesocoxae with a dense row of long setae on posterior (internal) edge. Trochanters elongate, mesotrochanters twice as long as wide, pro- and metatrochanters 1.5 x as long as wide. Femora clavate, proximal parts narrower than trochanters, from basal fourth-third gradually expanded, widest between distal half and third, then narrowing toward apex. Tibiae slender, protibiae almost straight, meso- and metatibiae slightly recurved. Tarsi slender, tarsomere I 1.5 x as long as wide; II–IV diminishing in size; V nearly as long as two preceding tarsomeres together.

Male genitalia: Aedeagus (Fig. 6A–C) in dorso-ventral view drop-like in shape, with flattened, rounded base and indistinctly demarcated, subtriangular apical part. Length: 0.21 mm. Parameres symmetrical, slender, not reaching apex of aedeagus, very slightly curved. Each paramere with long apical seta and a pair of subapical setae; long subapical seta located in an angle formed by enlarged apex of paramere. Base of

parameres with a pair of lateral recurved hook-like structures directed toward apex of aedeagus. Ventral opening located between bases of parameres, very indistinctly delimited, broad; dorsal opening indistinct; basal part of dorsal wall of aedeagus with circular foramen with darker, circular plate inside. In lateral view, ventral wall of aedeagus with pointed apex curved ventrally; apical part of dorsal surface with distinct swelling. Armature of internal sac symmetrical, with broad central duct open at basal end and narrowing toward apex, at each side with elongate sclerites having complicated internal lamination in apical half. Apex of aedeagus subtriangular, pointed.

Female. Unknown.

Distribution. Japan: Kagoshima Pref. (Tokunoshima Is.).

Holotype: ♂, Mt. Inokawadake, Tokunoshima Is., Kagoshima Pref., 2. V. 1988, S. NOMURA leg. (NSMT).

Etymology. "Born in Japan"; after the country name, and Latin "generasco" meaning "to be born".

Remarks. This species is very similar to *Neseuthia cactiformis* sp. nov., however can be easily distinguished by very distinct tubercles on the head, different pronotal punctation, only two pairs of lateral setae on elytra, and the shape of aedeagus.

Neseuthia cactiformis sp. nov.

[Japanese name: Tsushima-harabiro-kokemushi]
(Figs. 2D; 3D; 4F; 6D–F)

Diagnosis. This species can be distinguished from all other Japanese *Neseuthia* by having almost impunctate pronotum without longitudinal groove, head with a pair of very small, hardly visible tubercles, a pair of long, erect lateral setae on pronotum and by possessing four long setae on each elytron (three lateral setae and one in the middle of posterior fourth).

Description. Body relatively slender, reddish-brown, with distinct division between pronotum and elytra; setation sparse, short, recumbent, yellowish. Sides of pronotum and elytra additionally with long, erect setae.

Male (Fig. 2D). Body length: 0.94 mm. Head (Fig. 3D) in natural position retracted into pronotum up to hind edge of eyes, widest at eyes, length: 0.11 mm, width: 0.25 mm. Vertex slightly convex, with a pair of yellowish tubercles as small as single ommatidium, each located at internal edge of eye; frontoclypeal area slightly convex; supraantennal tubercles indistinct; antennal insertions located between eyes, beneath dorso-anterior edge of head, mouthparts hardly visible in dorsal view; clypeus subrectangular. Eyes convex, large, nearly circular, coarsely faceted, with sparse and fine setae. Head impunctate, glossy; setation relatively sparse and short, recumbent. Antenna (Fig. 4F) longer than combined length of head and pronotum, with slightly flattened, distinctly demarcated club composed of last two antennomeres, with relatively sparse, long and erect setation, last three antennomeres additionally with several very long, erect setae, antennomeres X–XI with subapical ring of short, relatively dense setae. Antennomeres I and II subcylindrical, 1.5 x as long as wide, markedly larger than III–VIII; III subquadrate; IV–VIII slightly longer than wide; IX slightly larger than X; antennomere X large, slightly wider than long, widest near anterior fourth; XI subconical, only slightly longer than X.

Pronotum convex, widest near anterior third, sides slightly narrowing posteriorly in middle third, then nearly parallel up to hind angles, length: 0.29 mm, width at base: 0.34 mm, maximal width: 0.39 mm. Anterior edge broadly emarginate, front angles well developed, projecting anteriorly (in strictly dorsal view front angles not visible); lateral edges entire, sharp, finely serrated; base slightly biemarginate; hind angles right; base

with two pairs of shallow lateral foveae, median longitudinal and basal transversal groove missing. Disc almost impunctate, glossy, punctures very fine, hardly noticeable; setation composed of relatively dense, short, recumbent to suberect setae; each side of pronotum with additional pair of long, erect lateral setae, one at anterior third, the other one in hind angle. Base of pronotum with a pair of long posteriorly-directed setae located in middle, at both sides of scutellum.

Elytra entire, ovoid, widest near middle, very convex, separately rounded at apex, length: 0.54 mm, combined width: 0.46 mm. Distal part of pygidium exposed. Elytral base as wide as base of pronotum, with very distinct humeri delimited by shallow but distinct internal humeral groove, and with small humeral denticle; basal foveae small, located closer to humeral denticle than to scutellum; scutellum triangular, with distinct medio-basal pit. Elytra glossy, individual punctures indistinctly delimited, sparse and fine; setation composed of short, sparse suberect setae and additional, long erect setae: three very long setae located on external margin of each elytron, and single long seta in the middle of hind fourth. Hind wings well developed, twice as long as elytra.

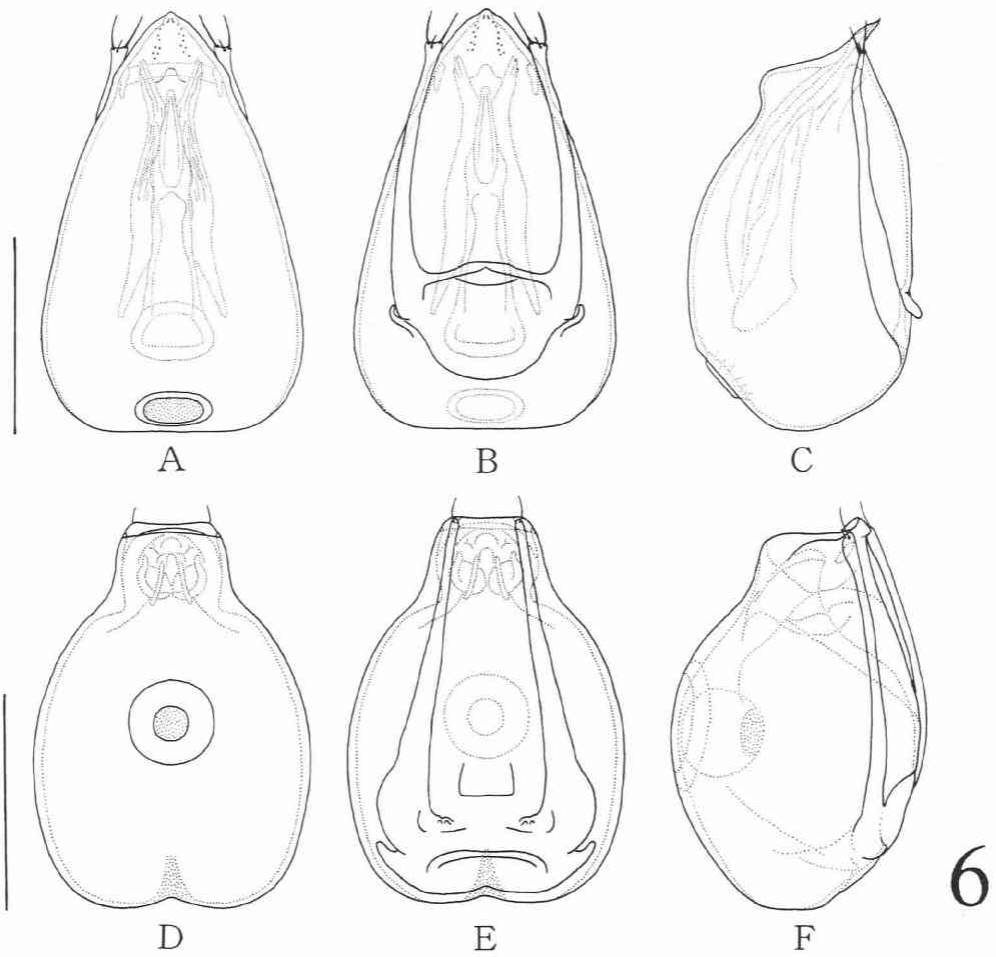

Fig. 6. Aedeagus in dorsal (A, D), ventral (B, E) and lateral view (C, F). — A, B, C, *N. japonigena* sp. nov.; D, E, F, *N. cactiformis* sp. nov. Scale: 0.1 mm.

Venter: Procoxae separated by narrow and relatively high prosternal process, basisternal area of prosternum very narrow, with indistinct irregular punctures. Mesosternum between mesocoxae 3 x as wide as prosternal process, with longitudinal carina and similar irregular punctuation as on basisternum. Metasternum as long as pro- and mesosternum together, with small, but distinct tubercle in hind fourth of the midline, very convex, glossy and impunctate; metacoxae separated equally widely as mesocoxae. Six abdominal sternites visible, sternite I 1.5 x as long as subequal sternites II–V; VI subtriangular, as long as III–V together, apex broadly rounded. Sutures between sternites slightly arcuate. Ventral side with relatively sparse, short, recumbent setation, setae on abdominal sternites distinctly longer.

Legs relatively long and slender, with relatively short, recumbent and suberect setation. All coxae elongate, transversal, mesocoxae longest, procoxae with a dense row of long setae on posterior (internal) edge. Trochanters elongate, 1.5 x as long as wide, mesotrochanters largest. Femora slightly clavate, proximal parts narrower than trochanters, from basal fourth-third gradually expanded, widest between distal half and third, then narrowing toward apex. Tibiae slender, protibiae almost straight, meso- and metatibiae slightly recurved. Tarsi slender, tarsomere I 1.5 x as long as wide, II–IV diminishing in size, V nearly as long as two preceding tarsomeres.

Male genitalia: Aedeagus (Fig. 6D–F) in dorso-ventral view bottle-like in shape, with voluminous basal part and well separated apical part. Length: 0.175 mm. Parameres symmetrical, slender, almost straight, broad at base, narrowing toward apex, apex slightly broadened in side view. Parameres not exceeding apex of aedeagus, with one short and one long apical seta; base with a pair of recurved, hook-like lateral structures parallel to sides of aedeagus. Base of aedeagus with shallow median constriction; ventral opening indistinctly delimited, relatively broad; dorsal opening confined to apical part of aedeagus (a "bottle neck"); central part of dorsal wall of aedeagus with open, circular foramen with darker, circular plate inside. Armature of internal sac symmetrical, relatively small, located in apical part of aedeagus. Most distinct and characteristic parts of internal sac in dorso-ventral view is a pair of lateral oval structures with two elongate sclerites: C-shaped external sclerites and rod-like internal sclerites protruding toward truncate, slightly emarginated apex of aedeagus.

Female. Unknown.

Distribution. Japan: Kyushu (Tsushima Is.).

Holotype: ♂, Mt. Tatera, Tsushima Is., Nagasaki Pref., 2. VI. 1988, S. NOMURA leg. (NSMT).

Etymology. The name reflects the resemblance of the sparse, long, erect elytral setae to spines of cactuses.

Remarks. This species is the smallest member of the Japanese *Neseuthia*, it closely resembles *N. japonigena*, however it has much smaller, hardly visible tubercles on the head, almost impunctate pronotum and a very characteristic chaetotaxy.

Discussion

The four new species described herein form two distinct species groups. *Neseuthia nomurai* and *N. hobbiti* both have a very characteristic median tubercle or expansion on vertex in males, transversal as well as longitudinal groove on pronotum, only short setae on pronotum and elytra, and metasternum without tubercle. Males of *N. japonigena* and *N. cactiformis* have a pair of lateral tubercles on the head, paired, long erect lateral setae on pronotum and sides of elytra, pronotum without transversal or longitudinal groove, and metasternum with small, but distinct median tubercle. The presence of

similar hook-like structures at base of parameres and a circular foramen located near base or in central part of dorsal wall of aedeagus provide additional evidence for a close relationship between *N. japonigena* and *N. cactiformis*. The aedeagus of *N. hobbiti* possesses an odd design; however artifactual distortions during preparation and/or possibly partly erected condition of the internal sac cannot be excluded.

Most species of *Neseuthia* don't exceed 1 mm, and several are as small as ca. 0.5 mm (*N. vitiensis* FRANZ, *N. minima* FRANZ, *N. mauritiensis* FRANZ, *N. sumatrana* FRANZ). The Japanese species can be regarded as relatively large, with their body lengths of about 1 mm. It's noteworthy that a large diversity of male head modifications and pronotal sculpture exists within the genus. The various head modifications known in *Neseuthia* include convex longitudinal tubercles or keels on vertex, often delimited by deep lateral grooves and/or accompanied by pair of pits; a pair of impressions; convergent grooves and a transversal lamina; grooves and a pair of tubercles; a pair of small tubercles only; or, finally, the head without any particular features. The pronotum may possess two pairs of lateral pits, in some cases internal pits are connected with a transversal groove; sometimes pits are indistinct, in some species five small foveae are present, sometimes connected by a groove, rarely an additional longitudinal groove is marked (FRANZ, 1971a; 1971b; 1974; 1982; 1983; 1984; 1986).

The genus *Neseuthia* is known to occur in Asia, NE Pacific, Mascarene Is., Seychelle and Australia (NEWTON and FRANZ, 1995). In the Oriental Region the members of *Neseuthia* have been found in Sri Lanka (FRANZ, 1982; 1983) and Sumatra (FRANZ 1982; 1984; 1985). A single female of an undescribed *Neseuthia* sp. collected in Vietnam is preserved in the National Science Museum, Tokyo. However, we prefer not to describe a new species until a male specimen becomes available. Taking into account the occurrence of the four new species in the southern Japanese islands, a wider distribution than presently appreciate may be expected. In particular, discovery of *Neseuthia* in Taiwan is highly plausible.

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